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# Medical Costs and Other Aspects of Dog Bites in Baltimore

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INJURIES CAUSED BY DOG BITES have grown to epidemic proportions in recent years and are now of major public health significance. Animal bites may lead to dangerous viral and bacterial infections, such as rabies, pasteurellosis, and tetanus, and the injuries may result in permanent scars, severe disability, and even death (1).

During 1972, a total of 7,436 animal bites, including 6,922 dog bites, were reported to the Baltimore City Health Department. These totals represented a 147 percent increase over the 2,933 animal bites, including 2,884 dog bites, reported for 1953. The rate per 100,000 population rose from 303 to 836 during the same period, a 186 percent increase (1, 2).

In February 1973, William Donald Schaefer, Mayor of Baltimore, appointed an Advisory Committee on Canines to study and evaluate the increasing problems of animal bites and stray dogs

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and to make recommendations to implement better animal control measures. Much information that had been gathered and published over the years was available to the committee (1-4); however, to our knowledge, no definite information on the medical costs and material losses from animal bites had been published in recent years.

Because information regarding the financial burden of dog bites was desired, the Baltimore City Health Department decided in late February 1973 to conduct two surveys. In addition to seeking information on medical costs, we wished to collect data on the degree of disability sustained by the dog bite victims and the ownership of the biting dogs.

### The First Survey

In March, questionnaires were sent to the victims in the 500 dog bite cases reported from November 1, 1972, through January 4, 1973. Although these months are the "seasonal low" for dog bites, it was decided to survey the cases because of the possibility of the victims forgetting details of an incident occurring more than 3 months earlier. The 3-month time frame was also chosen because medical costs and long-term effects of dog bites may not be apparent until at least 2 months after such incidents.

Of the 500 questionnaires sent, 20 were returned because of an incorrect address or other reasons pertaining to mail delivery. Of the 480

questionnaires apparently delivered, 214 were completed and returned, a response of 45 percent.

The patients in half of the cases for which questionnaires were completed were children under 15 years (table 1), a finding consistent with other studies (1, 3). Also, 62 percent of the persons bitten were male, and 38 percent were female.

The victims' visits to a medical facility (physician's office, hospital, or clinic) and days of disability were tabulated. The results were as follows:

| Medical facility visits or disability days | Number of persons |      |
|--|-------------------|------|
|  | Visits            | Days |
| 0 .....                                    | 5                 | 134  |
| 1 .....                                    | 160               | 31   |
| 2 .....                                    | 37                | 14   |
| 3 or more .....                            | 12                | 35   |
| Total .....                                | 214               | 214  |

Eighty patients reported being disabled 1 or more days. Parents of 51 school and preschool children reported disability or time lost from school of up to 14 days. Of 29 adults reporting various periods of disability, 1 claimed being disabled 3 months after the bite. Other extensive periods of disability reported were 75 days, 60 days, 30 days, and 27 days. Time lost from work ranged up to 14 days. It is interesting that the 49

**Table 1. Age and sex of persons bitten by dogs, Baltimore, November 1, 1972-January 4, 1973**

| Age group (years)  | Male | Female | Total  |         |
|--------------------|------|--------|--------|---------|
|                    |      |        | Number | Percent |
| 0-4 .....          | 10   | 9      | 19     | 8.8     |
| 5-14 .....         | 56   | 30     | 86     | 40.3    |
| 15-24 .....        | 22   | 13     | 35     | 16.4    |
| 25-44 .....        | 20   | 7      | 27     | 12.6    |
| 45-64 .....        | 15   | 12     | 27     | 12.6    |
| 65 and over .....  | 7    | 7      | 14     | 6.5     |
| No age given ..... | 3    | 3      | 6      | 2.8     |
| Total .....        | 133  | 81     | 214    | 100.0   |

**Table 2. Dollar costs to 45 persons reporting medical bills and at least one other expense resulting from a dog bite, Baltimore, November 1, 1972-January 4, 1973**

| Range of costs        | Number of persons | Percent of group | Average cost | Total cost |
|-----------------------|-------------------|------------------|--------------|------------|
| Up to \$25 .....      | 7                 | 15.5             | \$19         | \$135      |
| \$26-\$50 .....       | 27                | 60.0             | 37.50        | 1,011      |
| \$51-\$100 .....      | 8                 | 17.8             | 72           | 579        |
| More than \$100 ..... | 3                 | 6.7              | 162          | 485        |
| Total .....           | 45                | 100.0            | \$49         | \$2,210    |

**Table 3. Ownership of dog and who paid the expenses of the dog bite victim, Baltimore, November 1, 1972–January 4, 1973**

| Dog's owner                     | Total cases |         | Owner paid |         | Owner did not pay |         |
|---------------------------------|-------------|---------|------------|---------|-------------------|---------|
|                                 | Number      | Percent | Number     | Percent | Number            | Percent |
| "Our dog".....                  | 40          | 18.7    | 40         | 100.0   | 0                 | .....   |
| Neighbor's or friend's dog..... | 89          | 41.6    | 12         | 13.7    | 77                | 86.5    |
| Stranger's dog.....             | 48          | 22.4    | 5          | 10.4    | 43                | 89.6    |
| Dog's owner unknown.....        | 37          | 17.3    | 0          | .....   | 37                | 100.0   |
| Total.....                      | 214         | 100.0   | 57         | 26.3    | 157               | 73.7    |

patients (23 percent) who made two or more visits to a medical facility were also disabled 2 or more days.

Twenty-one persons (10 percent) required sutures for their wounds; one patient required 30 stitches, and another, plastic surgery to repair a severed nose. A total of 120 persons, or 56 percent of the group, reported that they had visible scars as a result of the bite. The scars ranged from one-fourth of an inch to 6 inches long.

Tetanus injections were administered to 199 persons. Some of the 15 patients not given injections had been immunized shortly before they were bitten. To the best of our knowledge, none of the victims surveyed received antirabies vaccine; no cases of rabies in dogs have occurred in Baltimore City since 1947.

The direct medical expenses incurred by the bitten persons or their families were as follows:

| Medical bill                                       | Number | Percent |
|--|--------|---------|
| None .....   | 6      | 3       |
| Up to \$10 .....                                   | 14     | 6       |
| \$11–\$25 .....                                    | 65     | 30      |
| \$26–\$50 .....                                    | 56     | 26      |
| More than \$50 .....                               | 10     | 5       |
| Paid by medical assistance or insurance plan ..... | 63     | 30      |
| Total .....  | 214    | 100     |

In 30 percent of the cases there was no information about medical costs. Most of the patients in these cases were covered by a public medical assistance plan, and no expense statements were sent to them. The average bill for the 145 patients reporting medical costs was \$38.50. For the 121 cases in which medical expenses ranged from \$11 to \$50, the average cost was \$25.50. The three highest medical bills reported were \$756, \$721, and \$350.

Those who had been bitten, or the parents of children who were bitten, were asked the cost of

repairing or replacing clothing damaged in the incident and any other costs incurred. Only 52 patients reported damages to clothing; 38 reported costs up to \$10, and 14, costs of more than \$10. One person reported clothing damages of \$98.

Forty-nine persons reported other expenses. These included veterinary bills for an injured dog, babysitting payments, cab fare, damage to an automobile, and loss of salary because of time away from work. The largest amount claimed was \$201, and represented lost salary. Two other patients reported salary losses of \$125 and \$75. One man reported damage amounting to \$75 caused when he climbed on his car to avoid further injury by an attacking German Shepherd.

To ascertain expenses for those who sustained clothing damage as well as other expenses, we analyzed 45 cases in which medical and at least one other type of expense was reported (table 2).

Analysis of total costs was complicated by the 30 percent of those bitten who were covered by medical assistance or other plans. Some of these persons sustained damage to clothing or other property, but they did not know the cost of their medical treatment. However, with these limitations in mind, it is interesting to compare the medical costs previously listed with the total expenses (table 2). The average medical bill was \$38.50, but the average total cost was \$49, an increase of more than 25 percent. It is worth remembering that a single dog bite accident may result in costs of several hundred dollars or more.

We were interested in obtaining information on the ownership of the biting dogs and on how many owners paid the expenses of the victims. One in five patients were bitten by the family dog; two in five by dogs living in the neighborhood; and the other two in five by dogs belonging to strangers or dogs whose owners were not known (table 3).

**Table 4. Summary of hospital survey of treatment of dog bite victims, Baltimore, February 1972–February 1973, in percentages**

| Item  | Number hospitals reporting | Average for hospitals reporting | Range       |
|---|----------------------------|---------------------------------|-------------|
| <b>Site of bite:</b>                          |                            |                                 |             |
| Face, head, neck.....                         | 19                         | 12.5                            | 0–40        |
| Hands, arms.....                              | 19                         | 27.4                            | 5–45        |
| Legs.....                                     | 19                         | 57.5                            | 20–95       |
| Patients admitted to hospital.....            | 17                         | 1.0                             | 0–10        |
| Patients needed followup treatment.....       | 18                         | 38.7                            | 0–100       |
| Patients received tetanus toxoid.....         | 19                         | 90.5                            | 43–100      |
| Patients received antibiotics.....            | 17                         | 20.3                            | 0–60        |
| Bites required sutures.....                   | 18                         | 11.9                            | 0–90        |
| Standard emergency room charge (dollars)..... | 19                         | \$18.30                         | \$10–\$28   |
| Charge for suture (dollars).....              | 16                         | \$23.25                         | \$6–\$58    |
| Charge for antibiotic (dollars).....          | 7                          | \$5.60                          | \$2.60–\$10 |
| Charge for toxoid (dollars).....              | 16                         | \$2.18                          | \$.50–\$10  |

About 26 percent of the dog owners paid all or part of the medical expenses that resulted from the bite; however, 40 persons were bitten by their family pet. The victims' expenses were paid for only 17 persons (12.4 percent) of 137 bitten by someone else's dog whose owner was known. Furthermore, if we omit the 40 family dog cases and include the bites by dogs whose ownership was unknown, only 17 of 174 persons (less than 10 percent of those bitten) were reimbursed for their expenses by the dog's owner.

Respondents were also asked for additional comments. Those who replied were generally concerned about the increasing problem of stray and ownerless dogs on the city's streets, and the threat they posed to innocent pedestrians.

### The Second Survey

Simultaneously with the survey of dog bite victims, a questionnaire was sent to both the physician and administrator in charge of the emergency departments of all 20 Metropolitan Baltimore hospitals. Replies were received from 19 hospitals. Each respondent was asked to estimate certain aspects of dog bite management in his hospital's experience during the previous 12 months. Replies from the hospitals are summarized in table 4.

Considering the limited number of cases and hospitals surveyed, the range of medical expenses, and the seriousness of individual injuries, there is an interesting similarity in the average costs cited by the hospitals and the responding patients. These were as follows:

| Item   | Hospital | Patient |
|--|----------|---------|
| Average medical charge.....                      | \$32.00  | \$38.50 |
| Patients needed hospitalization (percent).....   | 1.0      | 1.0     |
| Patients needed more than 1 visit (percent)..... | 38.7     | 23.0    |
| Patients received tetanus toxoid (percent).....  | 90.5     | 93.0    |
| Bites required sutures (percent).....            | 11.9     | 10.0    |

Because the hospital data did not include the more costly injuries, the hospitals' average costs tended to be lower than those reported by the patients.

The hospitals reported that, of the persons bitten, one of eight sustained wounds of the face and neck, one of four were bitten on the upper extremities, and more than half, on the lower extremities (table 4). These data correspond to findings in a Norfolk, Va., study in which 15 percent of the bites were of the face, head, and neck; 33 percent of the upper extremities; and 52 percent of the trunk and lower extremities (3). One of five patients treated at the hospitals was given antibiotics.

### Discussion and Comments

As in most cities in the United States, there has been an increase in the number of dogs in Baltimore that are obtained for companionship or for protection. The result is an increase in the free-ranging (owned or ownerless, unsupervised and free-running) dogs (5). Also, there has been an increase in dog bites, as reflected in the records of the Baltimore City Health Department. Dog bites can be expensive in terms of medical costs, costs of torn clothing, lost wages, and other expenses.

Baltimore's health department has recorded

animal bites for 20 years and has endeavored to keep the public informed of the potential problems of animal bites, how to avoid being bitten, and what to do when one is bitten.

In this report we have been concerned with the medical and related costs of dog bites, which have proved to be significant. The two surveys have yielded baseline information not readily available heretofore in this area of public health. We hope the results of the surveys will aid public health officials attempting to estimate the medical expenses and other costs attributable to animal bites and to obtain public support for effective animal control measures.

## REFERENCES

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The public health hazard of dog bites has grown to epidemic proportions. It has also created a significant financial burden in terms of medical costs and other losses for those injured. To obtain baseline information on such medical costs, the Baltimore City Health Department conducted surveys of bite victims and of the emergency rooms of area hospitals to collect information regarding their experience with dog bites. The survey of patients covered the period November 1, 1972–January 4, 1973, while the hospital survey covered 12 months prior to February 1973. The survey of victims also included questions on the degree of disability sustained and the ownership of the biting dog.

Of 214 responses (45 percent) to 480 questionnaires, 145 patients reported medical costs averaging \$38.50; the highest medical bills were \$756, \$721, and \$350. Sixty-three persons (30 percent) were covered by medical assistance or insurance plans and had no information on their medical costs. For 45 persons reporting medical costs and at least one other type of expense, the average total cost was \$49. The average hospital charge reported by 19 of 20 hospitals surveyed was \$32.

One in five patients was bitten by the family dog, two in five by a neighborhood dog, and two in five by dogs belonging to strangers or persons unknown. Fewer than 10 percent of those bitten by dogs

not belonging to them were reimbursed by the dog owner for the expenses incurred.

Two hundred and nine patients visited a medical facility; 80 reported disability days; the longest period was more than 3 months. Children reported up to 14 days absence from school, and adults lost up to 14 days from work. The hospitals reported that more than half of the bites were on the leg, more than one in four on the hands and arms, and one in eight on the face, neck, and head.

The results of the two surveys may aid public health officials in estimating medical expenses and other costs of animal bites and in obtaining public support for effective animal control measures.